

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Dana Alexa Totir et al. Art Unit : 1745
Serial No. : 10/800,905 Examiner : Raymond Alejandro
Filed : March 15, 2004 Conf. No. : 1479
Title : NON-AQUEOUS ELECTROCHEMICAL CELLS

Commissioner for Patents
P.O. Box 1450
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**FOURTH DECLARATION OF DANA ALEXA TOTIR, KIRAKODU S.
NANJUNDASWAMY AND MICHAEL POZIN UNDER 37 C.F.R. § 1.131**

1. We are the inventors of the inventions claimed in the above-captioned patent application. The following work was conducted in the United States.

2. Two laboratory notebook pages from a laboratory notebook of Dana Alex Totir are attached. The notebook pages are signed by Ms. Totir and are dated prior to December 3, 2002. The two pages are true and complete copies from the original notebook, except that the dates on the laboratory notebook pages have been whited out and information is highlighted as described below.

3. The laboratory notebook pages demonstrate that electrochemical cells covered by claims 1-5, 8-12, 14-24, 28, 31-35, 39-43, and 45-46 were made and used prior to July 29, 2002.

(a) Some of the information on the notebook pages is highlighted for convenience. See in particular the highlighted information next to "Cell #1" on page 2489-110 and "Cell #2" on page 2489-111. The electrochemical cells were coin cell models that included a plastic housing, a cathode including "9-EMD" (9-electrolytic manganese dioxide) on a "primed Al" (aluminum) current collector. The aluminum current collector in turn was pressed on an "SS grid". SS is stainless steel, and the aluminum current collector thus was in contact with a second metal surface (the stainless steel) different from the surface of the aluminum current collector. The cells included a "Li" (lithium) anode and an electrolyte including "0.05 M" (page 2489-110) or "0.03 M" (page 2489-111) LiBOB." LiBOB is lithium bis(oxalato)borate. Thus, the electrochemical cells described on laboratory notebook pages 2489-110 and 2489-111 include all of the requirements of claims 1-2, 5, 8-12, 31-35, and 45-46.

(b) Laboratory notebook pages 2489-110 and 2489-111 refer to “LiBOB in TDE10” in the highlighted information next to “Cell #1” and “Cell #2”. TDE10 is an internal name for an electrolyte that includes, among other ingredients, lithium trifluoromethanesulfonate. Thus, electrochemical cells on laboratory notebook pages 2489-110 and 2489-111 also include all of the requirements of claims 3 and 4.

(c) The aluminum cathode current collector used in the electrochemical cells on laboratory notebook pages 2489-110 and 2489-111 had a size of at least one dimension greater than 2 millimeters. Thus, the electrochemical cells on laboratory notebook pages 2489-110 and 2489-111 include all of the requirements of claims 14-16.

(d) The electrochemical cells on laboratory notebook pages 2489-110 and 2489-111 were designed to be discharged once and then discarded, and thus are primary electrochemical cells as opposed to secondary (rechargeable) electrochemical cells. Thus, the electrochemical cells on laboratory notebook pages 2489-110 and 2489-111 meet all of the requirements of claims 17-24, 28, and 39-43.

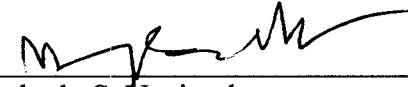
4. We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that those statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both under section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.



Dana Alexa Totir

06/03/08

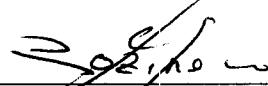
Date



Kirakodu S. Nanjundaswamy

05.28.2008

Date



Michael Pozin

05.19.08

Date

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21924048.doc

No. 2489-110

Ag pseudo-reference electrode

Subject Matter

All corrosion com all the were inconsistent (read very non-a
long range)

Must test in more ref. cells.

- Test:
- Ni-based cathodes pressed in 55 grid w/ Ag contact
 - NHOH, 100 mV ref
 - corrosion of 434T com and of H₂ anode @ 3.8V (n. 3.7)

Impedance measurement with Ag pseudo-reference electrode

3-electrode all w/ Ag reference working electrode, Li counter
and reference electrode

measured OCV of Ag electrode w/ Li reference is 73.8mV

Cross Ag (wet) w/ Li(CO₂) in Ringerite in PC, 1st cycle

CV of Au (wet), Ag (R), Li(CO₂) w/ Ringerite / PC / Li(CO₂)
Ag (wet), Ag (R), Li(CO₂) w/ Ringerite (PC / Li(CO₂))

To compare the peak potential for Ag (R) and Li(RC)
to find out the potential difference.

[Cell 1]

Ag/AgCl a primaire K, Pb control 1651 732

pressed in 55 grid w/ galvanic Ni strip (45)

250g expand, 0.05 M LiSO₄ as electrolyte propy

1x2 60° 1000 cycles until

NHOH ref (33 mV)

Measurements

- dt 2110 a1. or - Au(w), Li(R), Li(C), 1mM LiClO₄ in TSO₁₀, CV between 2.7-3.7 V @ 20 mV/sec
- dt 2110 a2. com - Ag(w), Au(C), Li(R), 1mM LiClO₄ in TSO₁₀ - open circuit experiment to monitor Ag potential w/ Li
- dt 2110 a3. com - Au(w), Li(C), Ag(R) - 1mM LiClO₄ in TSO₁₀ PBM 6th. 0-0.7 V vs. ref @ 20 mV/sec
- dt 2110 a4. com - Au(w), Li(C), Ag(R) - 1mM LiClO₄ in TSO₁₀ CV -0.6-8 V vs. ref @ 20 mV/sec
- dt 2110 a5. com same as above CV 6th. -0.6-8 V vs. ref @ 20 mV/sec

Witnessed & Understood by me,

Monks

Date

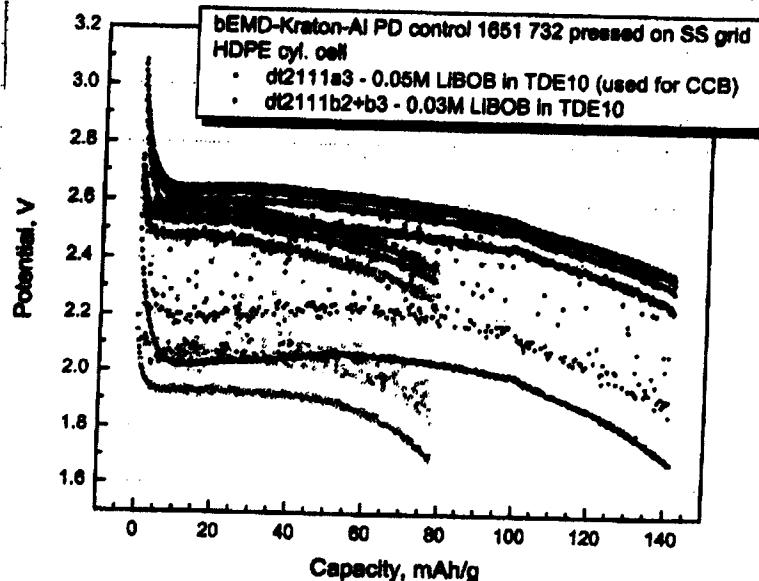
Recorded by

Date

Date

Subject Matter

- dt 2111 a1. or - Cell #1 dissolved in prop -10 + stopped after 170 pulses
NEC bat @ 3.3 mAh
 - dt 2111 a2. or - OCV for 2h (Cell #1)
 - dt 2111 a3. or - Cell #1, NEC bat, 3.3 mAh, 600 pulses
- Cell #2: β -OIM Kraton a pressed N, PD control 1651 732
pressed on SS grid w. 9 stacked Ni strip 160
dia. Cylindrical 1ml 0.08 n LiBOB a TDE10 (py)
1x2.6, 1000 g. 1. all.
- dt 2111 b1. or - open circuit, 2h
 - dt 2111 b2. or - NEC bat, 3.3 mAh 500 pulses
 - dt 2111 b3. or - NEC bat, 3.3 mAh additional 500 pulses
(collected next day)



Witnessed & Understood by me, <i>Mario</i>	Date	Recorded by <i>J. D. M.</i>	Date
	Date		